ON THE FAMILY SMARIDIDAE (ACARINA).

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(Four Text-figures.)

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In 1941 Womersley and Southcott revised and redescribed the Australian Smarididae, and made some alterations to the classification of the family; leaving it with four genera—*Smaris*, *Fessonia*, *Hirstiosoma* and *Sphaerotarsus*. They were able to record all of these genera except *Fessonia* from Australia, and thus were able to redefine the genera (except *Fessonia*).

Although it was considered at the time that the previous definition of *Fessonia*, and description of *Fessonia papillosa* (by Vitzthum, 1929) as having three sensillary areas to the crista was not likely to be correct, it was not then considered wise to alter the accepted definition of the genus. The doubt has been confirmed by the discovery of *Fessonia australiensis*, n. sp., from the Northern Territory of Australia; and an examination of this reveals the reason for the mistake: the crista is continued beyond the anterior sensillary area for some distance, onto the nasus, and there expands to form an area resembling an area sensilligera (which is frequently found in this position), but lacking any sensillary setae. This new species is described in the present paper.

In 1927 André erected the genus *Phanolophus* for *P. nasica*, a new species from Algeria.

Womersley and Southcott (1941) described the larva of *Smaris prominens* (Banks, 1916) as the first proven larval Smaridid, and stated that it differed from all described larval Erythraeidae in having the lateral tarsal claws identical. An examination of the figures given for *Hauptmannia* Oudemans, 1910 by Oudemans (1912) and an examination of some Australian material, shows that this larval genus, previously considered an Erythraeid, has the lateral tarsal claws identical (though differing from *Smaris* in that these are simple, not pulvilliform). It is considered that *Hauptmannia* is a larval Smaridid; and on grounds of its distribution, it is most likely to be the larva of *Hirstiosoma*.

The differences between the genera of the family are profound, and the opportunity is taken here to divide the family into sub-families:

Family Smarididae Kramer, 1878.

Key to the Sub-families with Genera.

A. Eyes anterior to both sensillary areas. Sensillary areas both well behind nasus.
  B. Dorsal and ventral shields present. Without crista. Eyes two on each side .... sub-fam. Smaridinae, n. sub-fam.
  With only one genus: *Smaris* Latreille, 1796.
  BB. No dorsal or ventral shields. With a well-marked crista which is produced forwards onto the nasus. Eyes two on each side, just anterior to anterior sensillary area ..... sub-fam. *Fessoniinae*, n. sub-fam.
  With only one genus: *Fessonia* von Heyden, 1826.
AA. Eyes between the levels of the anterior and posterior sensillary areas. Anterior sensillary area on or just behind nasus.
  C. Eyes one on each side. Anterior sensillary area right on nasus .... sub-fam. *Hirstiosominae*, n. sub-fam.
  With two genera: *Hirstiosoma* Womersley, 1934, and *Sphaerotarsus* Womersley, 1936.
  CC. Eyes two on each side, closer to the posterior sensillary area. Anterior sensillary area a little behind tip of nasus. Crista prolonged behind posterior sensillary area ..... sub-fam. *Phanolophinae*, n. sub-fam.
  With only one genus: *Phanalophus* André, 1927.

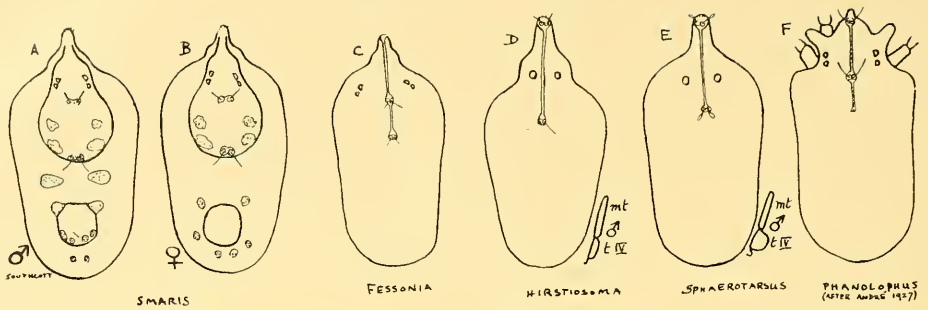

Fig. 1.—Characters of genera of adults of Smarididae.

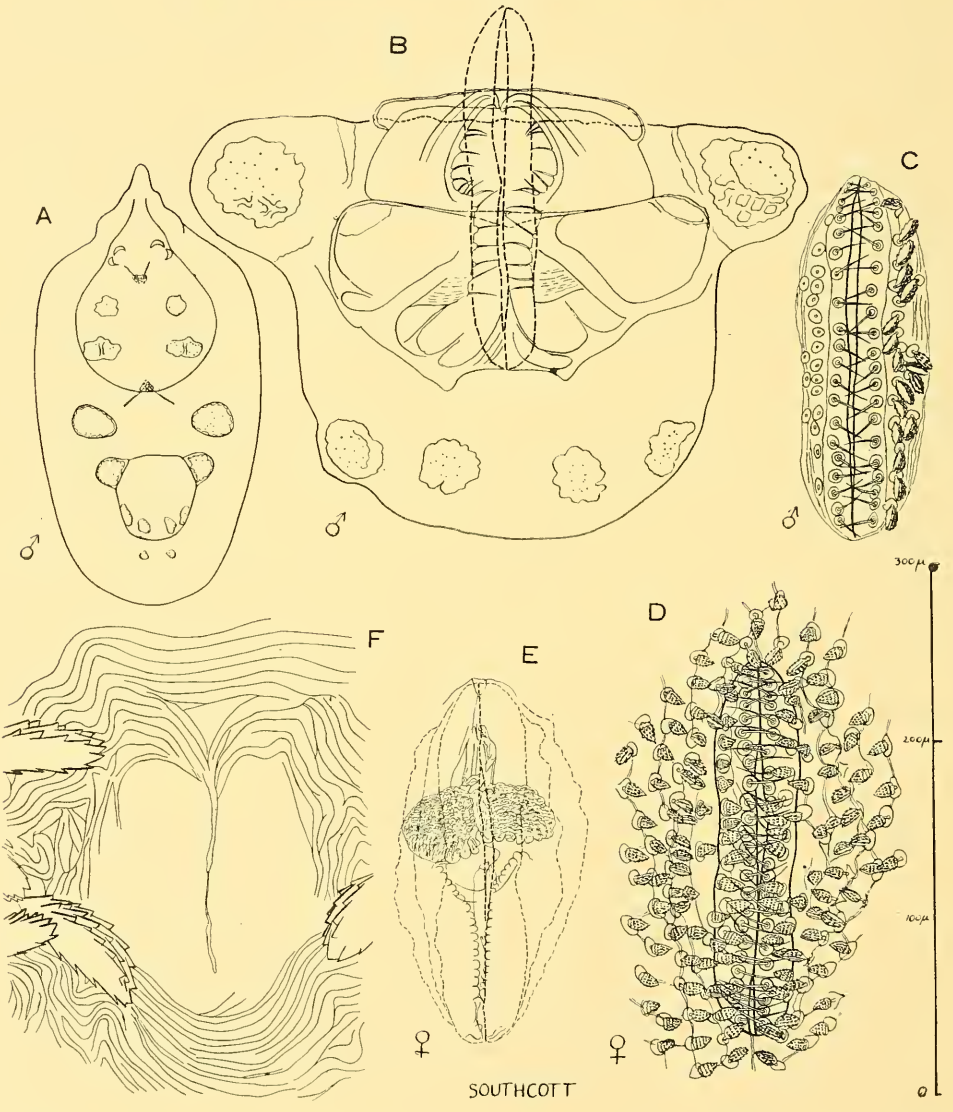

Fig. 2.—*Smaris prominens* (Banks, 1916). A-E, Adult. A, Dorsum of male showing plates and clear areas (muscular insertions); B, Internal and external genitalia of male superimposed upon figure of posterior dorsal shield; C, External genitalia of male; D, External genitalia of female; E, Female internal genitalia; F, Nymph, external genitalia.

Genus Smaris Latreille.

Précis car. gén. Ins., 1796, 180.

Smaris prominens (Banks, 1916). Figs. 1 A, B; 2 A-F; 3 A-F.

Fessonia prominens Banks, 1916, 225. *Smaris prominens* Wom. and Sthct., 1941, 63.

The opportunity is taken here of figuring the external genitalia of male and female adults, and nymph, also some other features. In the lymph the genitalia are occluded by a thin oval plate, which has a median raphe originating in the midline anteriorly, extending back almost to the posterior end of the plate. Sexes cannot be differentiated in nymphs, either on characters of genitalia or dorsal muscular plates (as they can be in the adults).

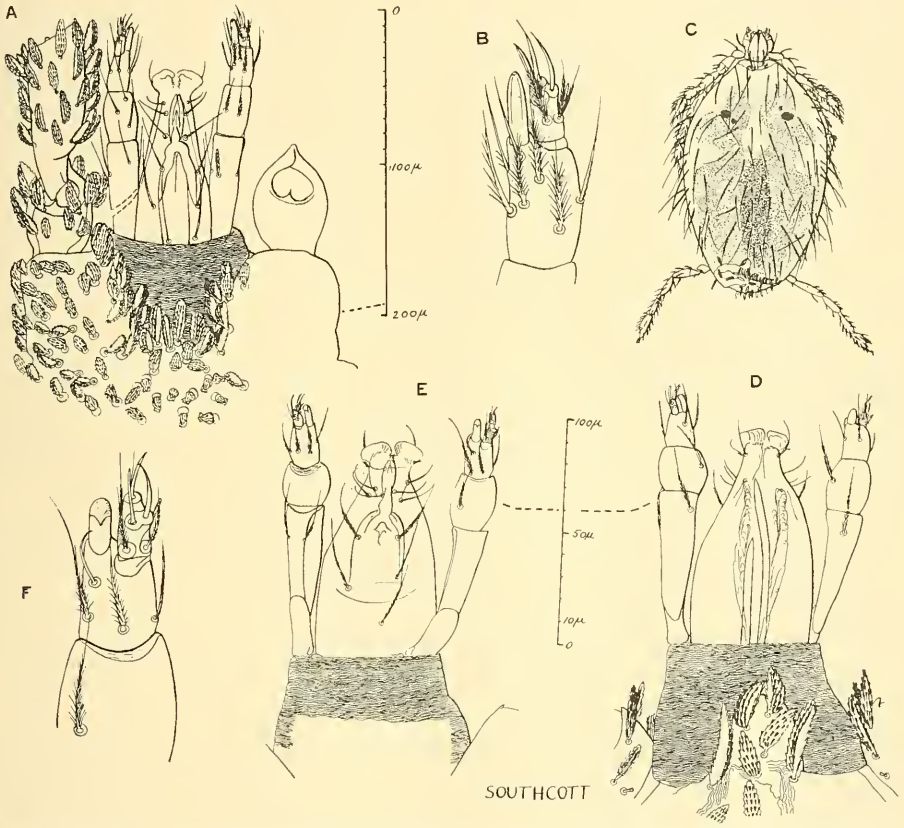

Fig. 3.—*Smaris prominens* (Banks, 1916). A-B, Adult. A, Mouth-parts from below (dorsal view of palp on left); B, Tip of palp; C, Larval skin attached to post-larval pupa, in which the pigment-masses are shown; D-F, Nymph; D, E, Mouth-parts from above and below; F, Tip of palp.

Smaris mamillatus (Say, 1821).

Erythraeus mamillatus Say, 1821, 70. *Smaris mamillatus* Oudemans, 1937, 952. *Erythraeus mamillatus* Jacot, 1938, 125.

Oudemans (1937, 952) repeats Say's description and refers the species to *Smaris* (s.l.). Jacot (1938, 125) suggests Say's species was a *Labidostomma.* The "indented punctures" of Say are considered by Oudemans as muscular insertions and these are a feature of *Smaris* (s.str.), and a "marginal impressed line" is also present in *Smaris* (s.str.) (see Womersley and Southcott, 1941, 64, fig. 1A, B, of *Smaris prominens* (Banks)). Say's "few distant hairs" are possibly the posterior sensillary setae. Accordingly Say's species is referred to *Smaris* (s.str.).

Genus Fessonia von Heyden, 1826.

Vers. syst. Einth., in *Isis*, xix (6), 609.

Fessonia australiensis, n. sp. Figs. 1 C; 4 A-L.

♀ Adult: Red, body oval, pointed anteriorly, slightly waisted around middle. Length 0·85 mm., width 0·46 mm. Crista linear, with two sensillary areas, the anterior being well behind the nasus. Crista continues beyond anterior sensillary area onto nasus. Each sensillary area with two ciliated sensillary hairs, anterior 51μ long, posterior 79μ; anterior sensillary area also with two of the normal dorsal setae 20μ long. Distance between centres of sensillae 146μ; from centre of anterior sensillae to tip of nasus 215μ. Eyes two on each side, just anterior to anterior sensillae, anterior being the larger and the more medial. Palpi as figured. Dorsal setae numerous, brown, dorsally convex, there with 6–8 lines of serrations, which mostly run down to the pedicel of the seta, ventral surface of dorsal setae flattened, and ciliated down the centre; setae 18–33μ long, some longer near the nasus to 37μ. Ventral setae with long strong ciliations, setae 18–24μ long. Legs: I, 990μ long; II, 700μ; III, 690μ; IV, 990μ (all including coxae). Tarsus I, 131μ long by 41μ high; metatarsus I, 210μ long; tarsus IV, 109μ long by 35μ high; metatarsus IV, 193μ long. Cuticle of legs including coxae porose. Various types of sensory setae are present on the legs, as in *Smaris*.

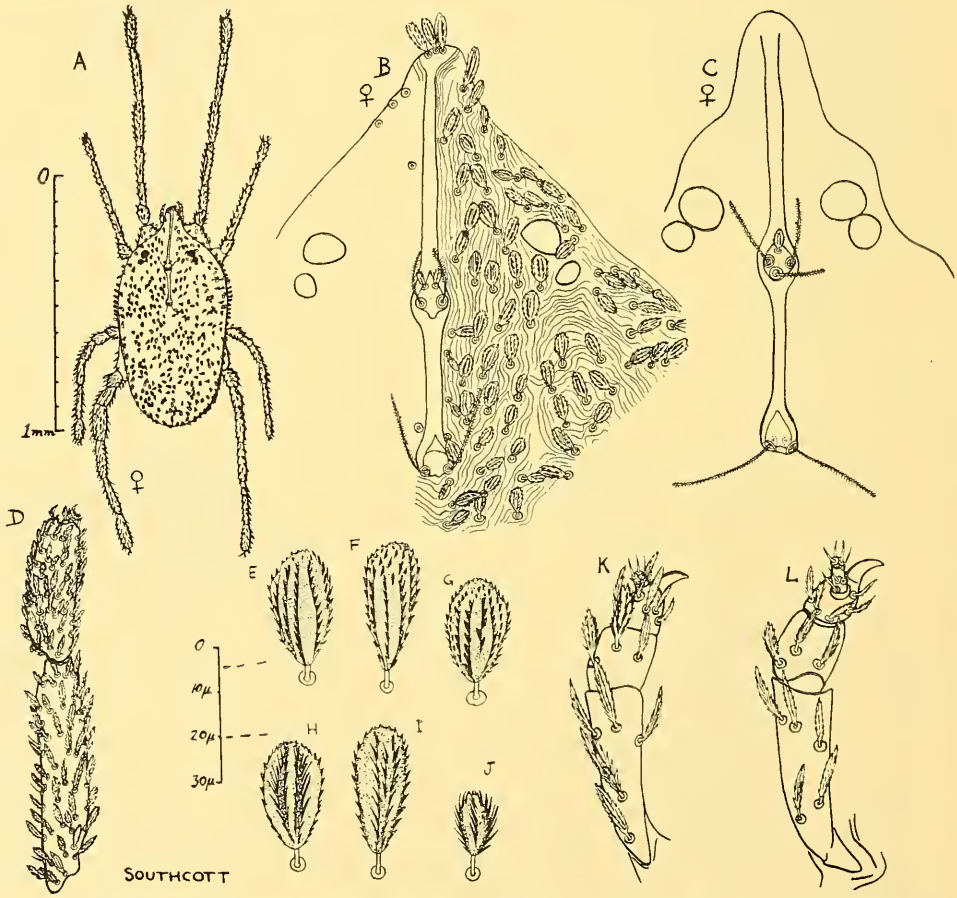

Fig. 4.—*Fessonia australiensis*, n. sp. A-L, Adult. A, Dorsal view, entire, female; B, Anterior part of dorsum; C, Eyes and crista of teratological specimen; D, Tarsus I and metatarsus I; E-J, Adult setae, with scale to left; E-G, Dorsal surfaces of dorsal setae; H-I, Ventral surfaces of dorsal setae; J, Ventral seta; K-L, Palp, K from above, L below. (All figures except C from type ♀.)

Habitat.—Northern Territory: Mataranka, found along the banks of the Roper River, under bark of Melaleuca, 28–29.iii.1943, four adults (R.V.S.). (Type ♀ and three paratypes in author's collection).

One specimen with an abnormal anterior sensillary area to the crista is figured in Fig. 4 C.

The anterior prolongation of the crista onto the nasus does not form a sensillary area, though superficially it has that appearance, and has misled previous workers. There are no sensillae on the nasus, only some of the normal dorsal setae being present.

A detailed comparison of this species with the European *F. papillosa* (Hermann, 1804) (the genotype) is not possible, as no good description of that species has been published. It must be emphasized that these descriptions must include measurements, and it is also imperative that a detailed drawing of the dorsal seta be included for specific determinations of these mites (this also applies in other families) to be possible.

Genus Hirstiosoma Womersley.

Rec. S. Aust. Mus., v (2), 1934, 242.

Hirstiosoma jacoti, new name.

Smaris sericea Jacot, 1938, 123. [non] *Trombidium sericeum* Say, 1821, 70. *Hirstiosoma sericea* Wom. and Sthct., 1941, 63.

Oudemans (1937, 1406) repeats Say's original description of *sericeum*, and considers it possibly a species of *Eutrombidium* (?). Say's statement "densely covered with a short silken hair" cannot be applied to any Smaridid.

Jacot (1938, 122) suggests that Say had mixed up his descriptions of *Trombidium scabrum* (1821) and *Trombidium sericeum*, and refers the former to his new genus *Trombiculoides*, and the latter to *Smaris* (s.l.). Jacot also states (p. 121) that he had caught "four specimens of a *Microtrombidium*" in Say's collecting localities, but does not describe them. The suggestion naturally arises that these are possibly Say's *sericeum*. It is best to follow Oudemans' decision on *sericeum*, and therefore Jacot's *Smaris sericea* must be renamed.

Genus Sphaerotarsus Womersley.

J. Linn. Soc., Lond. (Zool.), xl, 1936, 119, 269.

Sphaerotarsus womersleyi, new name.

Caeculisoma ripicola (as nymph) Womersley, 1934, 239. [non] *Caeculisoma ripicola* (adult) Womersley, 1934, 238. *Sphaerotarsus allmani* Womersley, 1936, (part), 40, 119, 269. *Sphaerotarsus ripicolus* Wom. and Sthct., 1941, 73.

The description of the nymph of this species *followed* the description of the adult *Caeculisoma ripicola* Womersley, 1934, with which it was wrongly correlated (this adult belongs to the Erythraeidae and is now the genotype of *Callidosoma* Womersley, 1936). Accordingly the name *ripicolus*, being based on a mis-identification, cannot stand for the nymph (Article 31) and is changed as above.

List of Smarididae.

The family as reclassified above will comprise the following species:

Smaridinae, n. sub-fam.: *Smaris squamatum* (Herm., 1804) Europe (genotype); *S. mamillatus* (Say, 1821) North America; *S. nicoletii* (Gervais, 1849) South America; *S. depilata* (Berlese, 1888) South America; *S. prominens* (Banks, 1916) Australia. *Fessoniinae*, n. sub-fam.: *Fessonia papillosa* (Herm., 1804) Europe (genotype); *F. australiensis*, n. sp., Australia. *Hirstiosominae*, n. sub-fam.: *Hirstiosoma scalaris* Wom., 1934, Australia (genotype); *H. novae-hollandiae* Wom., 1936, New Zealand; *H. tasmaniensis* Wom. and Sthct., 1941, Tasmania; *H. ampulligera* (Berlese, 1887), Europe; *H. jacoti*, new name, North America; *Sphaerotarsus allmani* Wom., 1936, Australia (genotype); *S. womersleyi*, new name, Australia; *S. leptopilus* Wom. and Sthct., 1941, Australia; *S. claviger* Wom. and Sthct., 1941, Australia. *Phanolophinae*, n. sub-fam.: *Phanolophus nasica* André, 1927 (genotype), North Africa.

The following species have been referred to the genus *Smaris* (s.l.) by various authors; but from their descriptions cannot at present be classified generically: *Smaridia villosa* Dugès, 1834 (see Oudemans, 1937, 962); *Rhyncholophus phloginus* Koch, 1837 (Oudemans, 1937, 957, 958); *Smaridia vestita* Gervais, 1849 (Oudemans, 961); *Smaridia ampulligera* var. *longipes* Berlese, 1888, 173; *Smaris longilinealis* Ewing, 1909, 61.

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